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| 09/735,907 | 12/14/2000 | Hironori Kikkawa | Q62301 | 5747 |

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EXAMINER

AKKAPEDDI, PRASAD R

ART UNIT PAPER NUMBER

2871

DATE MAILED: 11/12/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/735,907

Applicant(s)

KIKKAWA, HIRONORI

Examiner

Prasad R Akkapeddi

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 05 August 2003.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-9 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 22 August 2002 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☒ The proposed drawing correction filed on 05 February 2003 is: a) ☒ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 17.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

1. **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Response to Arguments

2. Applicant's arguments filed 08/05/2003 have been fully considered but they are not persuasive. The previous rejections as stated in the office action dated 05/05/2003 are still valid.

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

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4. Claims 1,2 and 5-9 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto et al. (Okamoto) (U.S. Patent No. 5,825,445) in view of Miyazawa (U.S. Patent No. 6,011,604). Both Okamoto and Miyazawa were previously cited in the Office action dated May 15, 2002.

a. As to claims 1-2: Okamoto in Fig 3 and in (Cols. 11 and 12) discloses a OCB type liquid crystal display with an active matrix substrate 12, having TFTs 12b, signal lines and scanning lines (not shown), pixel electrode 12a, and an opposing substrate 11 with a common electrode 11a and a liquid crystal 13 interposed between the two substrates and the rubbing directions RA of the two substrates ran parallel (same direction) and the orientation directions are limited to within 45 degrees for the horizontal axis as shown in Fig. 4. Okamoto does not explicitly disclose that the signal lines are formed in a same layer as the pixel electrode or that the signal lines extend along the long side direction of the pixel region. Miyazawa on the other hand, in disclosing a liquid crystal display device, discloses the specific arrangement of the signal lines (32), pixel electrode (34) and the signal line being in the same layer as the pixel electrode and being parallel and extending along the pixel region (Fig.3). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the specific configuration as disclosed by Miyazawa to the device of Okamoto to enhance the aperture ratio of the device.

b. As to claims 5-9: Miyazawa discloses plurality of pixel regions (34) each is surrounded by scanning lines (31) and signal lines (32), insulating film (37), TFT

(33), a transparent substrate (25) opposing the active matrix substrate (24) provided with a common electrode (44), a liquid crystal (26), a compensation electrode (35b) between the scanning line and the pixel electrode (Fig. 16), as recited in claim 5. The overlap of the electrode (35b) with the pixel electrode, as recited in claim 6 and the connection to the scanning line (31) is also shown in Fig.16, as recited in claims 7 and 8. Miyazawa also discloses that the opposing surface of the active matrix substrate (25) is formed into a flat surface (Fig. 2), as recited in claim 9.

5. Claim 3 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto and Miyazawa and further in view of the previously cited reference Ueda et al. (Ueda) (U.S.Patent No. 5,600,461).

Okamoto discloses an OCB type liquid crystal device showing the orientation of the molecules with the same rubbing direction and two substrates both having a common electrode and a TFT substrate with signal and scanning lines with emphasis on the bending nature of these molecules. Miyazawa also teaches a device having scan lines, signal lines and pixel electrodes and enhancing the aperture ratio. However, neither Okamoto nor Miyazawa disclose that the pixel electrode is formed in a layer located closer to the common electrode than the signal lines and the scanning lines. Ueda, on the other hand, discloses in detail, an active matrix liquid crystal display device with a TFT substrate 115, having plurality of scan lines 103, plurality of signal lines 105 and pixel electrodes 109. Another opposite substrate 119 with an opposite electrode

is opposed to the TFT substrate (Col 8, lines 32-33). The arrangement of the pixel electrode with respect to the signal and scan lines is shown in Figs. 8(a) and 8(b). The pixel electrode is clearly shown to be in a layer that is closer to the opposing electrode on the opposing substrate (119).

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the active matrix structure of Ueda to the liquid crystal structure disclosed by Okamoto and Miyazawa to decrease the parasitic capacitance formed between each pixel electrode and each scan line and between each pixel electrode and each signal line so as to prevent an uneven luminance and a cross talk of display pictures and to accomplish a good picture display (col. 4, lines 7-14).

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamoto, Miyazawa and Ueda as applied to claim 3 above, and further in view of Iizuka et al. (Iizuka) (U.S. Patent No. 6,515,720).

c. Iizuka discloses a side portion of the pixel electrode (53) overlaps the signal lines (50) (Fig. 1) (col. 4, lines 58-59). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to adapt the overlapping of the pixel electrodes with the signal lines to display high contrast image and increase the display area.

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Fuzikawa et al. (U.S. Patent No. 5,995,178)- discloses the overlap of pixel electrodes with the scan and signal lines.

Response to Arguments

Following is the response from the Examiner to the Applicant's arguments:

a. Applicant's argument No. 1 (page 2, lines 8-10): Neither Okamoto nor Miyazawa do not disclose the orientation films on both sides of the liquid crystal layer are oriented so as to have the same direction.

Examiner's response to argument No. 1: On the contrary, Okamoto does disclose that the orientation directions (RA) of the films on both sides of the liquid crystal layer being parallel, i.e., in the same direction (Fig. 3) (col. 12, lines 28-29).

b. Applicant's argument No. 2 (page 2, lines 11-12): Miyazawa merely discloses a TN-LCD (twist nematic liquid crystal device) and does not discuss an OCB type liquid crystal display device.

Examiner's response to argument No. 2: While the Examiner agrees with the applicant that Miyazawa does not discuss that his structure is of the OCB type, it is pointed out that the applicant in the instant application also does not discuss about the OCB structure except in describing the background art. The applicant extensively discusses the OCB structure as having a phase compensation plate in the background art. However, in the description of the 'summary of the invention' and the rest of the specification the compensation is done not by a phase compensation plate, as is done conventionally but by a compensation electrode (17). On page 23, lines 12-14 and elsewhere, the applicant states that 'the electric field between the signal lines and the pixel electrode converges on the compensation electrode, which results in reducing the horizontal component of the electric field and prevents the liquid crystal molecules from

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being twisted'. Besides, the applicant's liquid crystal material is of 'nematic' type (page 16, line 17 of the instant application).

Miyazawa's device also includes nematic liquid crystal material and while not using a phase compensation plate, Miyazawa teaches the use of a compensation electrode (35), the electrode (35) is located between the signal lines (32) and the pixel electrode (34) (Fig. 2) and states that the electrode (35) is of the shield type meaning having a function for alleviating a lateral field (col. 5, lines 14-16). Hence in the Examiner's opinion, the function of the compensation electrodes in both cases is similar. Hence the teaching of Miyazawa as a prior art is proper.

c. Applicant's argument No. 3 (Page 3, lines 1-5): Miyazawa does not disclose that the signal lines extend in the long side direction of a pixel region.

Examiner's response to argument No. 3: It is true that Miyazawa does not recite the above statement. However, what is commonly known in the literature need not be disclosed. In this case, extending of signal lines along the pixel region would have been obvious to one having ordinary skill in the art at the time the invention was made. Besides, though the signal lines are not shown, the relationship of the signal lines with the long side of the pixel region can easily be seen in Fig. 4 of Okamoto.

Please note that all the references were cited in the earlier office action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Prasad R Akkapeddi whose telephone number is 703-305-4767. The examiner can normally be reached on 7:00AM to 5:30PM M-Th.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert H Kim can be reached on 703-305-3492. The fax phone number for the organization where this application or proceeding is assigned is (703) 872-9306.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0530.

PRA

Prasad R Akkapeddi
Examiner
Art Unit 2871

T. Chaudhry
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